2.9 Water Quality and Storm Water Runoff

2.9.1 Regulatory Setting

2.9.1.1 Federal Requirements: Clean Water Act

In 1972, the Federal Water Pollution Control Act was amended, making the discharge of pollutants to the waters of the United States from any point source unlawful, unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. The Federal Water Pollution Control Act was subsequently amended in 1977, and was renamed the Clean Water Act (CWA). The CWA, as amended in 1987, directed that storm water discharges are point source discharges. The 1987 CWA amendment established a framework for regulating municipal and industrial storm water discharges under the NDPES program. Important CWA sections are as follows:

- Sections 303 and 304 provide for water quality standards, criteria, and guidelines.
- Section 401 requires an applicant for any federal project that proposes an activity, which may result in a discharge to waters of the United States to obtain certification from the State that the discharge will comply with other provisions of the act.
- Section 402 establishes the NPDES, a permitting system for the discharges (except for dredge or fill material) into waters of the United States. Regional Water Quality Control Boards (RWQCB) administer this permitting program in California. Section 402(p) establishes addresses storm water and non-storm water discharges.
- Section 404 establishes a permit program for the discharge of dredge or fill material into waters of the United States. This permit program is administered by the U.S. Army Corps of Engineers (ACOE).

The objective of the CWA is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters."

2.9.1.2 State Requirements: Porter-Cologne Water Quality Control Act (California Water Code)

California's Porter-Cologne Act, enacted in 1969, provides the legal basis for water quality regulation within California. This Act requires a "Report of Waste Discharge" for any discharge of waste (liquid, solid, or otherwise) to land or surface waters that may impair beneficial uses for surface and/or groundwater of the state.

The State Water Resources Control Board (SWRCB) and RWQCBs are responsible for establishing the water quality standards (objectives) required by the CWA, and regulating discharges to ensure that the objectives are met. Details regarding water quality standards in a project area are contained in the applicable RWQCB Basin Plan. States designate beneficial uses for all water body segments, and then set criteria necessary to protect these uses. Consequently, the water quality standards developed for particular water segments are based on the designated use and vary depending on such use. In addition, each state identifies waters failing to meet standards for specific pollutants, which are state listed in accordance with CWA Section 303(d). If a state determines that waters are impaired for one or more constituents and the standards cannot be met through point source controls, the CWA requires establishing Total Maximum Daily Loads (TMDLs). TMDLs establish allowable pollutant loads from all sources (point, non-point, and natural) for a given watershed.

2.9.1.3 State Water Resources Control Board and Regional Water Quality Control Boards

The SWRCB administers water rights, water pollution control, and water quality functions throughout the state. RWCQBs are responsible for protecting beneficial uses of water resources within their regional jurisdiction using planning, permitting, and enforcement authorities to meet this responsibility.

- **NPDES Program**
  The SWRCB adopted Caltrans Statewide NPDES Permit (Order No. 99-06-DWQ) on July 15, 1999. This permit covers all Department rights-of-way, properties, facilities, and activities in the State. NPDES permits establish a 5-year permitting time frame. NPDES permit requirements remain active until a new permit has been adopted.

In compliance with the permit, the Department developed the Statewide Storm Water Management Plan (SWMP) to address storm water pollution controls related to highway planning, design, construction, and maintenance activities throughout California. The SWMP describes the minimum procedures and practices the Department uses to reduce pollutants in storm water and non-storm water discharges. It outlines procedures and responsibilities for protecting water quality, including the selection and implementation of Best Management Practices (BMPs). The proposed project will be programmed to follow the guidelines and procedures outlined in the

2003 SWMP to address storm water runoff or any subsequent SWMP version draft and approved.

- **Municipal Separate Storm Sewer System Program**
  The U.S. EPA defines a Municipal Separate Storm Sewer System (MS4) as any conveyance or system of conveyances (roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, human-made channels, and storm drains) owned or operated by a state, city, town, country, or other public body having jurisdiction over storm water, that are designed or used for collecting or conveying storm water. As part of the NPDES program, U.S. EPA initiated a program requiring that entities having MS4s apply to their local RWQCBs for storm water discharge permits. The program proceeded through two phases. Under Phase I, the program initiated permit requirements for designated municipalities with populations of 100,000 or greater. Phase II expanded the program to municipalities with populations less than 100,000.
- **Construction Activity Permitting**
  Section H.2, Construction Program Management of the Department's NPDES permit states: "The Construction Management Program shall be in compliance with requirement of the NPDES General Permit for Construction Activities (Construction General Permit)". Construction General Permit (Order No. 2009-009-DWQ, adopted on September 2, 2009, became effective on July 1, 2010. The permit regulates storm water discharges from construction sites that result in a disturbed soil area (DSA) of 1 acre or greater, and/or are part of a common plan of development. By law, all storm water discharges associated with construction activity where clearing, grading, and excavation results in soil disturbance of at least 1 acre must comply with the provisions of the General Construction Permit.

  The newly adopted permit is a risk-based permit that establishes three levels of environmental risk (Risk Levels 1 – 3) possible for a construction site, based on project sediment risk and receiving water risk. Monitoring and reporting requirements increase as the Risk Level goes from 1 to 3. For example, a Risk Level 3 (highest risk) project would require compulsory storm water runoff pH and turbidity monitoring. When the project has a DSA of 1 acre or more, applicants are required to develop and implement an effective Storm Water Pollution Prevention Plan (SWPPP). The SWPPP, which identifies construction activities that may cause discharges of pollutants or waste into the waters of the United States or waters of the State, as well as measures to control these

pollutants (such as temporary BMPs), is prepared by the construction contractor and is subject to Department review and approval.

Caltrans Statewide NPDES Permit requires the Department to submit a Notice of Construction (NOC) to the RWQCB to obtain coverage under the Construction General Permit. Upon project completion, a Notice of Completion of Construction (NOCC) is required to suspend coverage. This process will continue to apply to Department projects until a new Caltrans Statewide NPDES Permit is adopted by the SWRCB. An NOC or equivalent form will be submitted to the RWQCB at least 30 days prior to construction if the associated DSA is 1 acre or more.

During the construction phase, compliance with the permit and the Department's Standard Special Conditions requires appropriate selection and deployment of both structural and non-structural BMPs. These BMPs must achieve performance standards of Best Available Technology economically achievable/Best Conventional Pollutant Control Technology (BAT/BCT) to reduce or eliminate storm water pollution.

2.9.2 Affected Environment

This section is based on the *Water Quality Assessment Report (WQAR)* for the I-5 HOV Lane Extension Project (May 2010).

2.9.2.1 Surface Water

The proposed project area drains to the San Juan Creek and San Clemente Coastal Streams watersheds.

San Juan Creek Watershed

The San Juan Creek Watershed originates in the Santa Ana Mountains. It begins in unincorporated Orange County and flows through the Cities of Dana Point, Laguna Hills, Laguna Niguel, Mission Viejo, Rancho Santa Margarita, San Clemente, and San Juan Capistrano. The proposed project drains to the Lower San Juan Creek portion of the watershed in the Cities of Dana Point and San Juan Capistrano. Approximately 0.9 mile of roadway improvements is within this watershed. The channel downstream of the proposed project is an engineered soft-bottom channel and extends to the Pacific Ocean.

San Clemente Coastal Streams Watershed

The San Clemente Coastal Streams watershed encompasses two subwatersheds, Prima Deshecha Cañada and Segunda Deshecha Cañada. Cascadita Creek is a

tributary creek to Prima Deshecha Cañada. Prima Deshecha Cañada drains through the City of San Clemente and the Capistrano Beach area of Dana Point, then confluences with the Pacific Ocean. Segunda Deshecha Cañada flows through unincorporated Orange County land and the City of San Clemente en route to the Pacific Ocean. Approximately three miles of the roadway improvements are within this watershed. The channel downstream of the proposed project is an engineered soft-bottom channel and extends to the Pacific Ocean.

Local Hydrology

Within the proposed project limits, runoff from I-5 discharges into drainage inlets that discharge to Lower San Juan Creek, Prima Deshecha Cañada, Segunda Deshecha Cañada, and Cascadita Creek via various culverts, which convey flows to the Pacific Ocean via engineered channels. Annual flows in the creeks vary greatly in any given year and they are typically at their peak during the winter and spring seasons. The proposed project intersects all three subwatersheds approximately 1 mile prior to their convergence with the Pacific Ocean.

The following beneficial uses were identified for San Juan Creek, Prima Deshecha Canada, and Segunda Deshecha Canada:

- **AGR:** Agriculture
- **IND:** Industrial Service Supply (San Juan Creek only)
- **MUN:** Municipal and Domestic Supply
- **REC-1:** Body-Contact Recreation
- **REC-2:** Nonbody-Contact Recreation
- **WARM:** Warm Freshwater Habitat
- **COLD:** Cold Freshwater Habitat (San Juan Creek only)
- **WILD:** Habitat for Wild Plants and Animals

San Juan Creek, Prima Deshecha Canada, and Segunda Deshecha Canada are listed on the 2006 CWA Section 303(d) List of Water Quality Limited Segments. The list was approved by the SWRCB in October 2006 and approved by the United States Environmental Protection Agency (EPA) on June 28, 2007. The mouth of San Juan Creek, the Pacific Ocean shoreline near the mouth of San Juan Creek, and San Juan Creek are listed for indicator bacteria. San Juan Creek is also listed for dichlorodiphenyldichloroethylene (DDE). Prima Deshecha Cañada and Segunda Deshecha Cañada are both listed for phosphorus and turbidity. No TMDLs have been developed for the water bodies to which the proposed project drains. Cascadita Creek

is not an impaired water body and no TMDL has been developed. The proposed project is not expected to be a major source of the pollutants for which the water bodies the proposed project drains to are impaired.

2.9.2.2 Groundwater

The proposed project site is located within the Mission Viejo and San Clemente Hydrologic Areas, specifically the Lower San Juan, Prima Deshecha, and Segunda Deshecha Hydrologic Subareas, as designated by the San Diego RWQCB. All the hydrologic areas are located in the San Juan Hydrologic Unit. The ACOE conducted a feasibility analysis to address the management plans of the San Juan Creek Watershed. The feasibility analysis states that the estimated storage capacity for the San Juan Creek Groundwater Basin is 90,000 acre-feet and the natural recharge from streambed percolation, rainfall infiltration, deep percolation, and subsurface inflow, is greater than approximately 10,500 acre-feet.

Groundwater has been measured at various off-site facilities along the I-5 during subsurface assessments. Along the northern portion of the study area, west of the I-5 between San Juan Creek Road on the north and Stonehill Drive on the south, groundwater was measured and estimated at 29.5 ft and 55 ft at 32841 Camino Capistrano and 33301 Camino Capistrano, respectively. Groundwater was reported to flow in a south-southwest direction at 32841 Camino Capistrano and to the west-northwest at 33301 Camino Capistrano.

Near the center of the study area, east of the I-5 at 606 Camino De Los Mares, groundwater was measured at depths ranging from 52 to 58 ft below ground surface (bgs) and groundwater was shown to flow to the south in 1993, and to the east-southeast in 2007. Near the southern end of the study area, groundwater was measured at depths ranging from 39 to 41 ft bgs at 530 Avenida Pico in 2007. Groundwater was not encountered in borings drilled to depths up to 68 ft bgs east of the freeway at 600 Avenida Pico. Groundwater flow was reported to flow generally toward the west/southwest.

Fluctuations of the groundwater level, localized zones of perched water, and soil moisture content should be anticipated during and following the rainy season. Irrigation of landscaped areas on or immediately adjacent to the study area can also cause a fluctuation of local groundwater levels.

The beneficial uses identified in the Basin Plan for the San Juan Creek, Prima Deshecha Canada, and Segunda Deshecha Canada Hydrologic Subareas include the following:

- **MUN:** Municipal and Domestic Supply
- **AGR:** Agricultural
- **IND:** Industrial (San Juan Creek only)

2.9.3 Environmental Consequences

2.9.3.1 Temporary Impacts

Alternative 1 – No Build Alternative

Under Alternative 1, no improvements other than routine roadway and bridge maintenance would be made. Therefore, Alternative 1 would result in short-term water quality impacts from construction-related activities.

Alternatives 2 and 4 – Design Options A and B

Pollutants of concern that could be generated during construction include the following:

- Sediments (grading operations)
- Trash (construction workers and construction waste)
- Petroleum products (equipment)
- Concrete waste (dry and wet)
- Sanitary waste (portable toilets)
- Chemicals (equipment coolant and concrete curing compounds)

During construction, the estimated total disturbed area from the proposed project activities is summarized in Table 2.9-1. The total disturbed area includes additional elements but is not limited to construction of the following:

- Retaining walls
- Auxiliary lanes
- Ramps
- Sound walls
- Drainage structures
- Proposed permanent water quality BMPs

Table 2.9-1 Estimated Disturbed Soil Area for Build Alternatives

Alternative Number	Estimated Disturbed Soil Area
Alternative 2	Option A = 132.3 acres Option B = 134.4 acres
Alternative 4	Option A = 126.1 acres Option B = 128.1 acres

Source: *Water Quality Assessment Report*, May 2010.

The proposed project will comply with the General Construction Permit as stated in Measure WQ-1.

If construction BMPs are not properly implemented, there could be indirect impacts to downstream water quality, such as increased sedimentation, turbidity, floating materials, and temperature. If construction BMPs are properly designed, implemented, and maintained, as presented in Measures WQ-1 and WQ-2, no adverse direct or indirect water quality impacts would occur during construction of the proposed project.

Though not anticipated, groundwater dewatering may be necessary to construct the bridge structure footings and culvert extensions. Dewatered groundwater may contain high levels of total dissolved solids (TDS), salinity, high nitrates, or other contaminants that could be introduced to surface waters during construction. Groundwater and any other nonstorm water dewatering activities are subject to the requirements of the De Minimus Permit (Order Number R9-2008-0002, NPDES Number CAG919002) and any subsequent permit. Compliance with this permit, as stipulated in Measure WQ-3, would avoid adverse impacts to water quality via dewatering. The dewatering may require the use of BMPs such as siltation discharge bags or baker tanks to remove potential pollutants that may be in the dewatering effluent.

2.9.3.2 Permanent Impacts

Alternative 1 – No Build Alternative

Under Alternative 1, there would be no direct impacts to water quality because there would be no change in land use. However under Alternative 1, there would be an indirect impact to long-term pollutant loading since the existing runoff would continue to remain untreated.

Alternatives 2 and 4 – Design Options A and B

Pollutants of concern typically generated during the operation of a transportation facility include sediment/turbidity, nutrients, organic compounds, trash and debris, oxygen-demanding substances, bacteria and viruses, oil and grease, pesticides, and metals. Because the proposed project consists of lane additions, it would result in a permanent increase in impervious surfaces and a permanent increase in runoff and pollutant loading. Alternatives 2 and 4 will result in the estimated new impervious area summarized in Table 2.9-2.

Table 2.9-2 Estimated New Impervious Area for Build Alternatives

Alternative Number	Estimated New Impervious Area
Alternative 2	Option A = 15.4 acres Option B = 16.0 acres
Alternative 4	Option A = 12.0 acres Option B = 12.4 acres

Source: *Water Quality Assessment Report*, May 2010.

The increase in impervious area caused by the proposed project would be relatively small (much less than 1 percent) compared to the urbanized area within the entire San Juan Creek and San Clemente Coastal Streams watersheds. The creeks downstream of the proposed project are engineered, master-planned facilities, the minor increase in runoff volume is not expected to result in channel erosion, and hydromodification is not expected within the San Juan Creek or San Clemente Coastal Streams watersheds. Operation of the proposed project is subject to the requirements of the Department's NPDES Permit. As part of these requirements, the Department must consider approved design pollution prevention (DPP) and treatment control BMPs for the proposed project site and construct DPP and treatment BMPs where feasible.

Currently, storm water runoff from I-5 within the proposed project limits is untreated. As part of the proposed project, treatment control BMPs must be implemented to target the constituents of concern in the storm water runoff from the study area. The proposed project will include BMPs that provide treatment for pollutants of concern per Department guidelines. Where feasible, DPP and treatment control BMPs will be incorporated into the proposed project design. The treatment control BMPs will be implemented to the maximum extent practicable (MEP). All treatment control BMPs will be located outside of California Department of Fish and Game (CDFG) and ACOE jurisdictional waters. The siting and selection of treatment control BMPs will

be decided consistent with the Department's *Stormwater Quality Project Planning and Design Guide*. BMPs selected will be based on the targeted constituents and may include any of the following: vegetated strips/swales, detention devices, infiltration devices, media filters, and/or other Department-approved treatment control BMPs. The approved devices have been scientifically tested by the Department to ensure expected pollutant loads from the proposed project will be reduced by implementation of DPP and treatment control BMPs.

Through complying with the Department's Statewide NPDES Permit, the Statewide SWMP (Measure WQ-1), grading and construction permits from Cities, Section 1602 (Streambed Alteration Agreement issued by the CDFG), Section 404 (of the CWA, issued by the ACOE), a dewatering permit (if necessary) and implementing Measures WQ-4 and WQ-5 to the MEP, the design and operation of the proposed project would not result in direct or indirect adverse impacts to water quality.

2.9.4 Avoidance, Minimization, and/or Mitigation Measures

The Department's SWMP is the guidance for compliance with the NPDES Permit requirement for discharge. As part of the Department's Project Delivery Stormwater Management Program described in the SWMP, selected construction site, design pollution prevention, and treatment control BMPs would be incorporated into the final design of the proposed project. Compliance with the standard requirements of the SWMP for potential short-term (during construction) and long-term (postconstruction/maintenance) impacts (listed below in Measures WQ-1, WQ-2, WQ-3, WQ-4, WQ-5, and WQ-6) is required.

WQ-1 The proposed project will comply with the provisions of the Department *Statewide NPDES Permit* (Order Number 99-06-DWQ, NPDES Number CAS00003) and the *NPDES General Permit, Waste Discharge Requirements (WDRs) for Discharges of Storm Water Runoff Associated with Construction Activities* (Order Number 2009-0009-DWQ, NPDES Number CAS000002) and any subsequent permit in effect at the time of construction.

WQ-2 A SWPPP shall be prepared and implemented to address all construction-related activities, equipment, and materials that have the potential to impact water quality. The SWPPP shall identify the sources of pollutants that may affect the quality of storm water and include construction site BMPs to control pollutants, such as sediment

control, catch basin inlet protection, construction materials management, and nonstorm water BMPs. All construction site BMPs shall follow the latest edition of the *Storm Water Quality Handbooks: Construction Site Best Management Practices Manual* (Department 2003) to control and minimize the impacts of construction-related activities, materials, and pollutants on the watershed. These include, but are not limited to, temporary sediment control, temporary soil stabilization, scheduling, waste management, materials handling, and other nonstorm water BMPs.

WQ-3 Construction site dewatering, if required, must comply with the *General Waste Discharge Requirements for Discharges from Groundwater Extraction and Similar Discharges to Surface Waters Within the San Diego Region Except for San Diego Bay* (Order Number R9-2008-0002 NPDES Number CAG919002), and any subsequent updates to the permit at the time of construction. Dewatering BMPs must be used to control sediment and pollutants, and the discharges must comply with the WDRs issued by the San Diego RWQCB. This will include submission of an NOI to the San Diego RWQCB at least three months before the start of dewatering and compliance with all applicable provisions in the De Minimus Permit, including water sampling, analysis, and reporting of dewatering-related discharges.

WQ-4 The Department-approved treatment BMPs will be implemented to the MEP consistent with the requirements of the NPDES Permit, Statewide Stormwater Permit, *WDRs for the State of California, Department of Transportation Properties, Facilities, and Activities* (Order Number 99-06-DWQ, NPDES Number CAS000003), and any subsequent permits. Treatment control BMPs may include biofiltration strips/swales, infiltration basins, detention devices, dry weather flow diversion, media filters, and wet basins.

WQ-5 Design pollution prevention BMPs shall be implemented, such as preservation of existing vegetation; slope/surface protection systems (permanent soil stabilization); and concentrated flow conveyance systems such as ditches, berms, dikes and swales, overside drains, flared end sections, and outlet protection/velocity dissipation devices.

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